PERENNIAL RYEGRASS "THE WHEAT OF THE GRASSLAND"

Lukas Wolters, Head of DSV forage and cover crop breeding, has been breeding new varieties at the Ven-Zelderheide subsidiary in the Netherlands

for 32 years

For a brief insight into grass breeding, you can watch this film

> Perennial ryegrass is the most valuable forage grass for intensively used meadows and pastures in terms of forage and crop production. Thanks to plant breeding, yields and qualities have been steadily improving, thus continuously increasing the basic fodder yield. This is how perennial ryegrass developed into the leading grass for grassland.

DSV breeds over a dozen forage grasses and legumes, which includes perennial ryegrass. Perennial ryegrass is also called the "wheat of the grassland" because of its high yield and forage quality potential. It thrives on almost all soils, with the exception of dry sites, and it is very tolerant of both cutting and grazing. For this reason, it is used in large parts of Europe as a mixing partner for grassland and in arable fodder mixtures. Furthermore, it has a very good nitrogen efficiency and regeneration capacity. With regard to these forage-growing properties, perennial ryegrass is superior to many other forage grass species and is the most intensively bred species with the longest tradition and greatest importance within forage plant breeding in North-West Europe. Deutsche Saatveredelung AG (DSV), for example, runs several breeding programmes for perennial ryegrass at various breeding sites in Europe. These include Ven-Zelderheide in the Netherlands, Wardington in the UK and Les Rosiers in western France. As part of the cooperation with the seed breeding company NPZ (Norddeutsche Pflanzenzucht), which has been in place since 2015, perennial ryegrass is also bred in Malchow, northern Germany.

Markets require different variety types

Within perennial ryegrass, varieties are divided into different segments. These result from the combination of early to late maturity groups and a diploid (twofold) or tetraploid (fourfold) chromosome set. The individual segments have different market significance. DSV's main markets for perennial ryegrass are Germany, France, the Netherlands, Great Britain, Denmark, Poland and the Baltic States. Due to their higher elasticity of use, varieties of the middle and late maturity groups are more in demand than early varieties, which are almost insignificant in Denmark or the Netherlands, for example. To ensure that each region receives varieties that are suited to its requirements, DSV maintains its own breeding programmes for the individual segments of perennial ryegrass.

Success of 50 years of breeding: Increase in dry matter yield of perennial ryegrass by

40/₆ from 85 dt/ha to 120 dt/ha.*

Varieties are constantly being further developed

In all segments, diverse breeding objectives are pursued in the development of new, improved varieties.

An increase in forage value and dry matter yield are of major importance with regard to high basic forage performance and are therefore fundamental breeding objectives for perennial ryegrass. If one compares today's grass varieties with those of 50 years ago, the progress made through plant breeding becomes clear: "The dry matter yield of perennial ryegrass, for example, could be increased from 85 dt/ha in 1965 by 40% to 120 dt/ha dry matter within 50 years "*. Furthermore, it is about stabilising and even increasing yields under non-optimal or changing cultivation conditions, such as increasingly dry summers caused by climate change or decreasing amounts of nitrogen fertiliser. It usually takes more than twelve years from breeding to marketing a new variety. Breeding experts therefore need to anticipate changes and trends for tomorrow today in order to breed new varieties with the right characteristics.



All candidate varieties are specifically analysed for their forage quality.

Rust screening in France

In order to develop its yield and quality potential, a variety must be as resistant as possible to pathogens such as rust fungi. The rust vulnerability of all DSV variety candidates is assessed at the French breeding station Les Rosiers. High humidity and warm days lead to high infection pressure, which the breeders use to select the most tolerant varieties.

Forage quality – must-have for milk production

For 25 years, DSV breeders have been selecting new forage plants not only for yield and tolerance to diseases and abiotic stress factors, but they also focus on forage quality. The aim is to develop highly digestible forage plants for high milk yield. This is influenced by the feed value parameters of the varieties, such as cell wall digestibility, sugar content and protein content. The analysis of the newly developed perennial ryegrass variety material is carried out using near-infrared spectroscopy (NIRS). Only the best varieties then receive the DSV "Milk Index" seal of quality. It distinguishes particularly digestible varieties with a high nutrient concentration. Their use increases the basic feed intake, which improves the health and performance of the animals. In France, Switzerland and Great Britain, the feed value parameters are already part of the official VCU (value for cultivation and use) tests and thus particularly important for variety registration.

Seed yield – a requirement for the production

In addition to the aforementioned breeding goals, sward density and persistence, even on difficult sites such as peat soils, there is one more important point from a grass breeders perspective: A high seed yield. In cereals, for example, seed yield is relevant both for seed production and for actual use, e.g. as fodder or baking raw material. In the case of forage grasses, seed yield must be optimised through breeding in addition to biomass. This is because a high seed yield is crucial for the economic

producibility of a variety. Therefore, seed yield trials are another important part of the breeding process.

Other important differences compared to cereals or oilseed rape are the multiple cuttings per year and the multiple years of biomass harvest (both in practice and in breeding). This makes the evaluation of forage grasses very elaborate and complex.

Internationally successful variety portfolio

DSV was founded in 1923 to ensure the availability of forage seed. Even then it was clear that high-quality forage could only be produced with high-quality seed. Since then, DSV breeding has produced hundreds of variety candidates. Currently, certified seed of more than 40 varieties of perennial ryegrass is produced and marketed. These cover all market and utilisation requirements of farmers in Germany and internationally.

Conclusion

Perennial ryegrass is called the "wheat of the grassland" because of its excellence in forage production. The multitude of regionally different climatic and utilisation requirements places diverse demands on the varieties and the development of their characteristics. The successful breeding of new, adapted varieties is based on the breeders' many years of know-how, their close cooperation with each other and the diverse locations where the variety candidates are tested for their performance under a wide range of conditions. New varieties – used in site-adapted mixtures – enable farmers to achieve higher yields and feed qualities, improved animal health and thus more milk from the basic feed.

Franziska Kremper, Product manager forage grasses/legumes



INTERNATIONAL SUCCESS WITH COUNTRY

The COUNTRY mixture programme has stood for successful forage production for almost 30 years. It combines knowledge about the variety of different forage grasses and legumes according to location and use. The fact that perennial ryegrass is a very important component of high-performance mixtures is also shown by our international voices from the field:

I became aware of the EXPLOSION variety through the Dutch recommendation list, as it is particularly convincing with its performance in the important first cut. Due to the very high yield in the first cut (rel. 111) and the above-average sugar content, I have been growing EXPLOSION for two years now as part of the mixture "COUNTRY Milkmore 14". With 5-6 cuts per year I achieve 120–140 dt DM/ha with it. «



Farm profile Oerlemans

Location: Ypecosga Friesland (In the north of the Netherlands)

Total area: 191 ha, of which 120 ha permanent pasture Livestock: 470, of which 270 dairy cows Annual output: 10,800 kg, fat: 4.2 %, protein: 3.5 %



Family farm profile Warnke

Location: Gajewo, district of Czarnków (in north-western Poland)

Total area: 90 ha, of which 55 ha are grassland Livestock: 180, of which 85 are dairy cows **Annual output:** 11,700 kg, **fat:** 3.9 %, **protein:** 3.4 % On my grassland around the Notéc River, I have been using COUNTRY mixtures with high percentages of perennial ryegrass for many years. "COUNTRY Energy 2027 Milk Index" and "COUNTRY Energy 2026 Protein" have a high utilisation flexibility and I use them for regular reseeding as well as for new planting. This has allowed me to not only increase my yield but also forage quality, which shows positively in milk yield.«

Adam Warnke, Farm Manager

We have been cultivating the perennial clover grass "COUNTRY Field Forage 2055" as a combination of perennial ryegrass, meadow fescue, timothy and red clover very successfully for a year. The composition of the different species, including the high proportion of red clover, works very well on our different soils from loam to moor. Compared to mixtures of other competitors, this mixture has delivered the highest yield in 2022. «

Edgars Zaļaiskalns, Farm Manager

Farm profile "Lejas-Krastiņi"

Location: Vaives pagasts, Cēsu novads (In the north-east of Latvia) Total area: 400 ha, of which 250 ha grassland

Livestock: 250, of which 125 dairy cows Annual yield: 11,600 kg, fat: 3.9%, protein: 3.3%

